

Reliable packaging for chemical-free food

April 9 2013, by Jean-François Haït



It is not obvious when examining a wrapped lettuce or a microwavable bowl of Chinese soup. But plastic food packaging is made of multiple layers designed to act as a barrier for oxygen or bacteria. "Each of these layers is made by a different manufacturer. Still, at the end of the chain, the food manufacturer who sells the packaged product is the sole responsible for food safety," notes Olivier Vitrac, a researcher at the Genial joint research unit of the National Institute of Agricultural Research (INRA-Agroparistech), located in Massy, near Paris. Scientists have been addressing the issue of such potentially harmful molecules diffusing from one layer to the next in food packaging, susceptible to ultimately contaminate the food. This work has been performed under

the [SafeFoodPackDesign project](#), coordinated by Vitrac and funded by the French National Research Agency (ANR).

Food [packaging](#) is designed to preserve the content as fresh and safe as possible. Its second function is to make the product look attractive to customers, using colourful prints. The problem is that this approach requires the use of potentially harmful molecules such as anti-ultraviolet radiations, anti-oxydisers, [glue](#) and [pigments](#) from inks. These substances have been suspected—albeit not always proven categorically—of being responsible for triggering cancers. They have also been accused of endocrine [disruption](#) because they contain substances like bisphenol A. This hormone-like chemical has recently been banned in France. It has also been the object of the EU funded ENDOCEVAL project, which aims at testing new packaging that are free from bisphenol A.

The SafeFoodPackDesign project goal is to build tools to help packaging manufacturers assess the [diffusion](#) risks of potentially harmful molecules, at every stage of the packaging's life; from manufacturing to final use, including transport and storage. As an example, piling up plastic cups designed to hold, for example, Chinese soup, results in putting the inked external layer in contact with the inner layer of the cup immediately underneath. As a result, ink molecules migrate towards the inner layer, which will eventually be in contact with the food. "In this case, the most critical step regarding chemical risk is with no doubt storage," Vitrac explains [youris.com](#).

The first task of the project team has been to build a database of materials used for packaging to document their molecular content. Now, they are measuring the diffusion speed of these molecules, in order to build predictive models. "Building migration models can be challenging in the case of a multi-layer packaging containing several chemicals in contact with non-homogeneous food. Besides, the input data available to

feed the model, such as packaging and food composition, is not always accurate," warns Peter Mercea, of FABES, a German company specialised in testing and evaluating migration of substances from packaging into foods.

By December 2014, the project team is expected to have developed an open-source software, based on a method used in aeronautics called Failure Mode Effects and Criticality Analysis, also referred to as FMECA, to detect every critical point on the packaging lifecycle where contamination could occur. A first version is already available.

This new tool could change the way plastic food packaging is designed and handled. At present, the EU Framework Regulation on food contact materials (EC) No 1935/2004 states that packaging must not transfer chemicals to food in quantities that may pose a threat to human health and alter significantly the composition and organoleptic characteristics of the food. "This regulation is already stringent and every new packaging must be proved individually safe before entering the market. But it says nothing about transport and storage and other possible critical points," explains Daniel Ribera, of Bio-tox , a consultancy specialised in sanitary and environmental risk assessment. If, "in addition, SafefoodPackDesign can help assess the related risks, it will provide a real increase in safety for manufacturers and therefore for consumers."

Provided by Youris.com

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